

orderly arrangements of a very simple kind which do not necessarily suggest Mental Purpose. They may be the effect of what we call accident, or of the action of elementary laws under no guidance or direction. Inorganic phenomena furnish many examples of such arrangements," &c., the argument proceeding to the conclusion that "the writers of the last generation were perfectly right in resting the general Argument from Design on the separate instances of adaptation in which the mark of Mind is most signal and conspicuous"—i.e. in organic structures. Now until it is shown wherein we are justified in classifying natural laws under two such categories as "elementary laws under no guidance or direction," and laws whose "action" gives rise to "separate pieces of evidence pointing to the operations of special design"—until this is shown I must remain of the opinion that "Mr. Darwin's theory of Natural Selection" does "touch this argument" of scientific teleology. The distinction between two such sets of general laws is clearly not one that can be recognised by science, and if it is conceded that the theory of Natural Selection is competent to explain the proximate or physical causation of "structural adaptations," we have no more right to refer the latter to ultimate or metaphysical causes than we have so to refer "orderly arrangements of a very simple kind which do not necessarily suggest Mental Purpose." For if this concession is made it means that the one set of causes differs from the other only, as I have said, in being somewhat more complex in character and less obvious in operation.

Again, the Duke of Argyll says he is "not able to accept" the distinction which I drew between scientific and metaphysical teleology. The distinction nevertheless remains, and it seems to me so obvious that I must suppose the Duke has in some way failed to appreciate my meaning. However he says, "The fundamental proposition of all arguments from Design is simply this: that the exquisite adaptations to special ends which are conspicuous in organic nature are, and can only be, the work of physical forces when these are under the combination and direction and control of Mind." But this is not "the teaching of the great masters" whom Dr. Carpenter names in his letter.¹ To some of them, at any rate, such a needless restriction of the argument to special adaptations in "organic nature" seemed unwarrantable, and since Mr. Darwin has shown how these special adaptations may be proximately explained by the operation of certain physical causes, the tide of theistic opinion has more than ever turned towards a still more "fundamental proposition" of the argument from Design, viz. that the harmonious uniformity of Nature as a whole demands some one co-ordinating principle as its explanation. And when from this proposition it is argued that the principle in question must be of a psychical character, the argument belongs to the province of what I have called metaphysical teleology. This, indeed, is merely the "Cosmo-theology" of Baden-Powell, who saw very clearly the distinction which I have endeavoured to present, and while inveighing more heartily than I have done against "the narrow and unworthy form in which the reasoning has been too often conducted," maintained that the "fundamental proposition," "the very essence of the whole argument, is the invariable preservation of the principle of order," &c.

Lastly, I do not understand the Duke where he says that I am much mistaken if I "suppose that the present generation is satisfied with the purely materialistic explanations of adapted structures which are erroneously supposed to be the final result of Mr. Darwin's theory." I have not said anything to imply that I supposed these explanations to be "purely materialistic." As a matter of individual opinion I do not think that in themselves they are. I see plainly enough that they have reduced the "exquisite adaptations conspicuous in organic nature" to the same general category of physical causation as all other phenomena in the physical universe; but for this very reason, if for no other, I should fail to see that they can be "purely materialistic" in the sense of touching the transcendental or extra-scientific question of Theism.

Having thus stated my views at some length, I shall take no further part in this correspondence, unless it should appear that some further explanation is desirable.

GEORGE J. ROMANES

¹ Except, perhaps, Mill, who thought highly of this form of teleology. But he also thought that if Mr. Darwin's "remarkable speculation" should be established as a truth of science, it would seriously "touch" the argument, as showing that "creative forethought is not absolutely the only link by which the origin of the wonderful mechanism of the eye may be connected with the fact of sight," &c.

Prof. Stokes's Lectures on Solar Physics

THE subject of these lectures (NATURE, vol. xxiv. pp. 593, 613) related primarily to the sun, and I was concerned with certain magnetic or electrical phenomena which are observed at the earth's surface only in so far as they related to the elucidation of the physics of the sun. Accordingly these collateral subjects were treated only very briefly, and I did not attempt to give anything like a history of the discoveries which have been made in them, even as regards the portions which bear more immediately on the physics of the sun. Indeed in many cases I designedly refrained from mentioning names, lest the hearers should suppose that I was giving a history of the subject, and those whose names might not appear in the very imperfect notice which it would have been should feel aggrieved. When a phenomenon was well known I generally contented myself with referring to it as such. Thus, for example, in alluding to earth-currents I spoke of them as what the progress of telegraphy had made us "familiarly acquainted with"; I said nothing about their discovery by Mr. Barlow, as described in his important paper published in the *Philosophical Transactions* for 1849, though it was a paper I had studied in connection with the lectures. I hope this example may suffice to prevent any one whose name does not appear from feeling annoyed at the omission, and to prevent the readers of NATURE from taking my lectures for what they were not intended to be, namely, a complete history of the subject. I take this opportunity of referring to one passage in my second lecture (NATURE, p. 415, a little above the figure), where I say "we might not have tension enough to produce such a discharge [i.e. a flash of lightning], the resistance to the passage of electricity from one portion of the air to another, which at any rate would be comparatively dry compared with what we have in warm latitudes, would prevent it by itself alone." These words, without actually asserting, seem to imply that the resistance to such a discharge through moist air would be less than through dry. My attention has been called by a friend to the fact that it has been found by experiment that moist air insulates as well as dry. I have not met with experiments tending to show whether the resistance to a disruptive discharge is the same or not in the two. Be that as it may, it does not affect what follows; for we know as a fact that thunderstorms are absent in high latitudes.

Cambridge, November 8

G. G. STOKES

The Society of Arts Patent Bill

IT appears that "the draft of a Bill for the Amendment of the Patent Laws has been prepared by a committee of the Society of Arts, and is published by the Council of that Society for consideration."

From the printed bill so prepared and published the following extracts are made:—

Extract from the Proposed Patents for Inventions Bill.

Section 3. "An invention is deemed new for the purposes of this act if it has not been published or publicly used in the United Kingdom, the Channel Islands, or the Isle of Man within the thirty years immediately preceding the date of the application of a patent for it.

"5. A patent may be granted under this act for:—

"(a) Any manufacture or any product not being a natural product;

"(b) Any machine, or any means of producing any manufacture, product, or result;

"(c) Any process or method of producing any manufacture, product, or result;

"(d) Any part of a machine, means, process, or method of producing any manufacture, product, or result.

"8. Commissioners of Patents and Examiners.

"(1) There shall be a Board of Commissioners of Patents for Inventions, in this act referred to as the commissioners:—

"(2) At any time after the passing of this act Her Majesty may, by warrant under the Sign Manual, appoint three persons to be commissioners, of whom one shall be experienced in engineering, one shall be experienced in chemistry, and one shall be experienced in the law.

"9.—(1) The commissioners may from time to time after the passing of this act, subject to the approval of the Treasury, appoint such persons qualified by knowledge of manufactures or science or arts, as they see fit, to be Examiners of Patents.

"Infringement of Patents."

"57. An action or other proceeding for infringement of a patent shall not after the commencement of this act be commenced in any of Her Majesty's Courts of Justice in England.

"58. For the purposes of this act a person is deemed to infringe a patent if he copies altogether or in part the invention of a patentee with the view of effecting the same or a like object, and fails to establish any of the pleas allowed by this act in a proceeding for infringement.

"59.—(1) A patentee may complain of any infringement of his patent to the commissioners.

"(2) The complaint shall be heard and determined by the commissioner (other than the legal commissioner) who is best acquainted with the subject-matter of the complaint, assisted by a legal assessor to be appointed for the purpose by the commissioners.

"(3) An appeal shall lie from the decision of the tribunal thus constituted to the three commissioners, who shall hear the complaint *de novo*, and their decision shall be final.

"(4) The commissioner or commissioners sitting to hear any complaint may decide all questions of law and fact, &c.

"60. The pleas allowed by this act in a proceeding under this Act for infringement of a patent are—

"That the particular matters alleged to be infringed do not show sufficient invention to justify the grant of a patent, or are not new within the meaning of this act;

"That the patentee is not the true inventor of the invention, or of so much of it as is alleged to be infringed;

"That the matters complained of do not amount to infringement;

"That the claim of the patentee as respects the matters complained of is not stated with sufficient clearness;

"That the specification is, as respects the matters complained of, incomplete or misleading;

"That the patentee, as respects any matter complained of, withheld that which he knew to be a better description than that given in the specification."

In commenting upon the above extracts it may be remarked that one main object of this bill appears to be to raise "*experts*" to the dignity and duties of the judicial bench. It is something quite new in the legal history of this country to make a man a judge because he has been frequently examined in court as a witness, and has shown considerable skill in baffling a hostile counsel.

The originality of such a proposal cannot be disputed, and accordingly the advocates of the present bill are justified in stating that it "provides for the trial of patent cases in an entirely new manner." What that manner is will be understood by referring to some clauses in the bill, the provisions of which are admirably non-legal in their phraseology.

By Section 57, "An action or other proceeding for infringement of a patent shall not, after the commencement of this act, be commenced" (in the only place where it can be brought, viz.) "in any of Her Majesty's courts of justice in England."

By Section 59, "A patentee may complain of any infringement of his patent to the commissioners."

Who then are to be the commissioners who are to stand in the place of the Lord Chancellor, the Master of the Rolls, and the law officers of the Crown, and who are to assume the functions of Judges of the High Court in ruthless disregard of the operation of the existing law?

By Section 8 they are to be three persons, "of whom one shall be *experienced* in engineering, one shall be *experienced* in chemistry, and one shall be *experienced* in the law." That is to say, they shall consist of two experts and a barrister.

To them the trial of all actions for the infringement of patents is to be relegated, but the proceeding is not to be called an action, it is to be "a complaint," and pleas only are to be raised by the defendant. It is here that the reformers, assisted by their barrister, show a wonderful capacity for disintegrating the law of patents.

They begin by defining the subject matter of a patent. This opens an opportunity for a display of strength, and they complacently remark that "at present the ancient definition of the Statute of Monopolies is in force, but, as a matter of fact, the question of subject matter depends wholly on the decision of the courts."

This is true, for we have from the period of James I., and

especially since the invention of the steam-engine, a series of judgments which have enunciated with remarkable clearness and force the principles which should guide the courts in dealing with any future patent wherein it may be doubtful whether or not the thing patented is the proper subject for a patent right.

But instead of deciding any new case upon principle, our reformers give us a definition, or rather they give four definitions, the third of which is large enough to swallow all the rest, and would probably satisfy the most ardent inventor.

Hereafter the subject of a patent shall be

"Any method of producing any result."

In spite of the protection afforded by the able Commissioners and their far-reaching staff of examiners, it may be doubted whether the public will feel quite safe in allowing monopolies to grow under the light of this definition. It may seem perhaps a little too general, it may include a few things more than the reformers have dreamed of.

Next, as to priority of invention:—

According to the Statute of Monopolies, patents may be granted for fourteen years for the "sole working or making of any manner of new manufacture within the realm to the *true and first inventor and inventors* of such manufactures which others at the time of making such letters patent shall not use," &c.

Hitherto a patentee must be the *first* inventor of the invention for which a patent is granted. Hereafter this distinction is abolished. "An invention is to be deemed *new* which has not been *published* or publicly used in the United Kingdom within thirty years immediately preceding the date of the application."

Lord Westbury has laid down "that the prior knowledge of an invention to avoid a patent must be such a knowledge as will enable the public to perceive the very discovery and to carry the invention into practice."

But inventions are now to be swept away by neglect and disuse. A process of de-publication is originated, whereby after thirty years neglect an invention may be deemed never to have been published, and the books wherein it has been described may be regarded as non-existent.

It has been a maxim of the law that when the public have once become possessed of an invention by lawful means, the right to use it can never be taken away from them. All this is done away with.

In what manner the promoters of this bill intend to work out their scheme of giving new birth to old inventions can hardly be understood from the above definition of a new invention, but the clause would appear to lead to endless confusion and uncertainty.

Next, as to infringement:—

By Section 58 "a person is deemed to infringe a patent if he copies altogether or in part the invention of a patentee with a view of effecting the same or a like object, and fails to establish any of the pleas allowed by this act in a proceeding for infringement."

The pleas are quoted in our extract from the bill, and a defendant may plead:—

"That the claim of the patentee as respects the matters complained of is not stated with sufficient clearness."

At present, as Lord Justice James has pointed out, there is nothing in the Statute of Monopolies or the patent law which says anything about claims. The legitimate object of a claim is the protection of the patentee, and a specification may be perfectly good without any claim at all. If there be a claim, the specification and claim are read together, and the claim must be construed with reference to the whole context of the specification.

According to the old practice a defendant would plead that the specification (whereof the claim, if there be one, forms a part) is insufficient.

According to the proposed bill the plea is to take the form:—That the *claim* is not stated with *sufficient* clearness. A plea to the sufficiency of clearness is somewhat embarrassing to a lawyer. Has it any meaning? and if so, what does it mean? The clearness which satisfied the patentee when he applied for his patent may not be sufficient to satisfy the commissioners when they are sitting in judgment. There may be some amount of clearness, but not enough. In the end, a patent may be wrecked on a mere verbal criticism, the very thing which the courts of law now set their faces against.

The infringement of a patent *only* takes place when a man *copies* the invention forming the subject-matter thereof. To limit an act of infringement in this way is absurd, and would

not be tolerated for an instant, as any patent lawyer would know.

As a matter of fact, there is a case pending which shows the risk of inventing new law. A company has brought an action for the infringement of a patent for making dynamite, the question being whether a man infringes a patent by acting as custom-house agent for admitting into this country a quantity of dynamite made abroad in infringement of an English patent. The Court of Appeal has given its judgment, and the case may go to the House of Lords. None of the six pleas enumerated in the draft bill will raise the question. And they will not raise another question which came up during the trial. The plaintiff company was formed to take over the dynamite patent from a prior company which then ceased to exist. The prior company assigned the patent to the plaintiffs with some very large words as to legal rights, and it became necessary to decide whether or not the second company could sue for infringements of the patent committed while the first company held it. The defence, that the right to sue for a tort is not assignable, could not have been raised under the proposed statutory pleas. Any plea which puts in issue the title of a complainant is inadmissible.

Lastly, as to the trial of a complaint of infringement:—

By Section 59 a complaint is to be heard in the first instance by the expert commissioner who is best acquainted with the subject matter. This judge is to be guided by a legal assessor, who will direct his mind into legal channels.

"From the decision of the tribunal thus constituted" (*sic*) an appeal will lie to the three commissioners, that is to say, to the original expert who has given his decision, to his brother expert, who is not experienced in the subject matter, and to the legal expert.

In other words, suppose the patent to be for a mechanical invention, and that we have three commissioners, A, B, C, of whom A is an engineer, B is a chemist, C is a lawyer.

A hears the case and gives his judgment; B knows nothing of mechanics, and reviews A's judgment with the advantage of having A at his side to keep him in the right path according to A's views, while C acts as a sort of legal adviser, it being part of the scheme that there shall be no models, without which it can scarcely be hoped that B and C will ever get so far as to understand the invention.

This is the mode of trial which it is gravely proposed to substitute for the present inquiry in a court of law, with a right of appeal, first, to the Court of Appeal, and afterwards to the House of Lords.

Here ends one part of the new bill. The procedure in obtaining a patent can only be carried out if commissioners are appointed according to the provisions already discussed. This would appear to be too improbable to justify any further encroachment upon your space.

LEX

"The Lepidoptera of Ceylon;"

THE Colonial Government has recently presented to the library of this establishment Parts I. and II. of the work above named, for the publication of which it granted a large sum of public money. The origin of the book was the existence here at Peradeniya of a very fine series of original drawings made during a course of years by the well-known botanical draftsman in the employ of the Gardens—Mr. William de Alwis—under the careful supervision of my eminent predecessor Dr. Thwaites. The plates now published are copies of these figures (the originals are in the Colombo Museum), and to these, Mr. F. Moore has added brief technical descriptions. As a botanist it would be presumption in me to express an opinion as to the merit of the text of an entomological book. There are thirteen new genera in the first part and six in the second, but only three out of the nineteen contain any new species; so at all events we get plenty of changes in the names of many long and well-known butterflies. But in the interests of scientific literature in general, I feel bound to enter a protest against the legend printed at the foot of every plate, "F. C. Moore, del. et lith.," as it is incorrect as to the facts. I have already stated by whom the figures were really drawn; it is however only fair to the unassuming Sinhalese artist to allow that as put on the stone and published they are very greatly inferior to the admirable originals. One would like to think that it was a consciousness of this that led Mr. F. C. Moore to substitute his own name for that of W. de Alwis. But however this may be, it is time that some explanation was given by him of what looks like very shabby treatment

of one of the best and most deserving natural history artists of the East.

HENRY TRIMEN

Royal Botanical Gardens, Peradeniya, Ceylon, October 10

An Alleged Diminution in the Size of Men's Heads

WHEN the latter's note was brought before the Council of the Anthropological Institute, I supported its reception and publication; my own observations have led me to the same conclusions. Setting aside for the moment the consideration of the authenticity of the statement—and I am not surprised that Prof. Flower should ask for more evidence—I would beg to call attention to the statistical results affecting infantine mortality, which are so well known to us in the statistical world. As we all know, it is a matter of congratulation that the rate of mortality in the periods from birth to two years, and from that to seven years, has much diminished in this country. This being so, the result is inevitable that many of the weaker infants that in a bygone day did not survive have now been saved; and their survival means the survival of so many weaklings. It appears to me that this is going on in the United States and in many neighbouring parts of Europe. The question of degeneracy under sanitary influence is well worthy of attention and investigation. While on the one hand we see in the streets fewer cases of deformity and of squinting owing to orthopaedic advances, there are many stunted individuals. The ears appear to me to be below the old standard in men and women. A well-formed ear was much more common in England than now. It also seems to me that the period of maturity in men (not puberty) is often later. The remark has been made that frigidity is more prevalent in women. It has come under my notice that the children of fine parents are often stunted, not belonging to the short races in the country, but being really stunted. We must always allow for a portion of the offspring belonging to the tall races, and a portion to the short races in the same family in England. My own belief is that the women are better than the men, and that when the effects of sanitary and medical improvement have become constant, that even the inferior women will exhibit a greater tendency to normal production. It is possible that the evil may be to some extent corrected by barrenness and frigidity. Looking back, I can find no effective cause in tight-lacing, as bad formerly as now, thicker or thinner hair since wigs, nor in wearing the hat.

32, St. George's Square, S.W.

HYDE CLARKE

Sound-producing Ants

WITH reference to a remark of Mr. S. E. Peal's (*NATURE*, vol. xxiv. p. 484) to the effect that white ants emit sounds, but not in rhythm, I have to observe that I have frequently heard white ants emit sounds with the most perfect rhythm, when, in the years 1857–1860, I was engaged in the Geological Survey of Trichinopoly, &c. On several occasions it happened that my tent was pitched on a piece of ground infested with white ants, and it was the custom of my servants to spread a thin layer of straw beneath the *satrinji* or cotton carpet that was laid on the tent floor. Often, when sitting in the tent in the quiet of the evening, I have heard the white ants at work in the straw, emitting perfectly rhythmical waves of sound at intervals of about a second, or perhaps rather more. If they were disturbed by raising the *satrinji*, the sounds ceased: to be resumed however after a minute or two, when all was quiet again.

Simla, October 15

H. F. BLANFORD

Song of the Lizard

ANY one who has been in the South of Europe in the summer may have often heard a peculiar sound in the fields or amongst low herbage. The sound is like *wheet-t-wheet* repeated two or three times at short intervals. I have often been puzzled as to what animal it proceeded from, and should have supposed it to be some orthopterous insect, but that on getting to exactly where the sound had come from, it would again be heard at a distance of some five or six yards without having been seen. Last June, near Ajaccio, I believed I solved the puzzle. After the *wheet-t-wheet* a small lizard darted across some unusually bare ground, and, once again under cover, recommenced its song. Our great authority, Dr. Günther, is not aware of any true lizard having any vocal power (geckoes have a *tchet-tchet*—not often heard—are generally nocturnal, frequenting houses or old walls, occasionally hiding under stones during the day).